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AMERICAN FORESTRY.

SPEECH

OF

HON. MARK H. DUNNELL

OF MINNESOTA,

IN THE

HOUSE OF REPRESENTATIVES,

THURSDAY, MARCH 9, 1882.

WASHINGTON.
1882.

SPEECH

OF

HON. MARK H. DUNNELL,

On the subject of appropriations for the Department of Agriculture.

Mr. DUNNELL said:

Mr. CHAIRMAN: The subject of forestry, both as regards the present and the future, is scarcely equaled by that of any other subject coming before us for our consideration and action. I desire to note some of its principal points in order that we may act intelligently upon it.

At an early period, and while Florida still belonged to Spain, the reservation of lands for maintaining a supply of timber for the Navy was proposed, and some feeble attempts at the cultivation of the live-oak upon the Georgia coast were begun.

Later we find applications for grants of land to encourage private enterprise in tree-planting, but no legislation looking toward the supply of timber for future wants can be found till 1873, when the first timber-culture act was passed. This gave a quarter section of land to every person who would plant a certain portion of it with trees. This act, as since amended, is still in operation. There are doubtless many cases where the undertaking has been abandoned; there may be others in which its terms have been evaded and the privilege abused; but there are thousands of young plantations under cultivation and managed in good faith and to the best ability of their owners. Very many of these promise excellent success.

Early in February, 1874, a committee of the American Association for the Advancement of Science brought a memorial from that body to the President, who laid the same before Congress. This memorial urged upon Congress the duty of the Government concerning the cultivation and the preservation of forests. After setting forth the great importance of these supplies, the rapidly increasing use and great waste, and the action taken by other governments under the pressure of necessities that must soon be realized in our own country unless timely provision be made to avert it, the memorial concluded with the recommendation that a commission should be ordered to mature plans calculated to meet the requirements of the subject. This memorial was considered in the House Committee on Public Lands, and referred to a sub-committee to mature and present a bill intended to further the objects set forth in the memorial. I had the honor to be chairman of the sub-committee, and was intrusted with the bill passed by the Committee on Public Lands for presentation to the House. The bill reported to the Forty-third Congress did not become a law. Early in the Forty-fourth Congress, I introduced a bill containing the principal provisions embraced in the former one, and before the close of the first session its vital portion was inserted as an amendment to a bill then pending, in which $2,000 were withdrawn from the moneys appropriated for the purchase of seeds to be distributed by the Department of Agriculture to make the first beginning in this investigation.

The amendment directed the Commissioner of Agriculture—

> To appoint some man of approved attainments, and practically well acquainted with the methods of statistical inquiry, with a view of ascertaining the annual amount of consumption, importation, and exportation of timber and other forest products; the probable supply for future wants; the means best adapted to the preservation and renewal of forests; the influence of forests upon climate, and the measures that have been successfully applied in various countries, or that may be deemed applicable in this country for the preservation and restoration or planting of forests, and to report upon the same to the Commissioner of Agriculture, to be by him transmitted in a special report to Congress.

On the 30th of August, 1876, Hon. Frederick Watts, then Commissioner of Agriculture, appointed Dr. Franklin B. Hough, of Lowville, New York, to this duty, and he has since been wholly employed upon this service.

The appropriation of the first Congress was somewhat increased, and since then the sum of $5,000 has been twice appropriated for the services and expenses incident to these duties.

Two reports have been made; the first for 1877, and the second for 1878–'79. Of the first, an extra edition of 25,000 copies was ordered. Of the second the Committee on Agriculture in the last Congress recommended the printing of 100,000 copies, together with the reprinting of 50,000 additional copies of the first report. It is proper to state that both these reports are now in stereotype plates. Unfortunately the resolution providing for the print of an extra edition of the second report, and the reprint of the first, as above stated, did not come before the House in season for its action.

The terms of the act under which these reports were made required that the statistics of exportation of timber and other forest products should be reported, and under this requirement a considerable part of the second report is devoted to the statistics which the law demanded. They cover the whole period of our existence as a Government, and in this particular they exhaust the whole subject. These reports have been elaborately reviewed and very highly commended in Europe; and in the international geographical congress, held in Venice in September last, they were awarded a diploma of honor.

In a lengthy review of the first of these reports, by an officer of the Würtemberg forest service, since made a professor in one of the German universities, the writer, after noticing the steps that had been taken from the first introduction of this subject, in 1873, to the date of publication, in 1878, says:

> It awakens our surprise that a man not a specialist should have so mastered the whole body of American and European forestry literature and legislation.

In the course of these inquiries Dr. Hough has made extensive journeys in various parts of the United States for the purpose of observing the wealth and the wants of the country in matters of forest supply, and during the last summer he has traveled under an appointment of the Commissioner of Agriculture for the purpose of gaining information concerning the forest systems of Europe. This journey extended through England, Scotland, Denmark, Norway, Sweden, Finland, Russia, Germany, Austria, Italy, Switzerland France, and Spain, and amounted to nearly 11,000 miles, besides ocean distances.

In the course of this journey, he visited about twenty special schools of forestry and the forest administration of every country that he entered. It is expected that his report upon the subjects mentioned in his instructions will be submitted by the Commissioner during the present Congress, but it is not embraced in his third special report, already finished but not transmitted to Congress.

It may be safely predicted that the information acquired by Dr. Hough in this extended field of investigation upon these intensely interesting topics will be accepted by the country with eminent satisfaction.

Having thus briefly presented the steps that have thus far been taken in regard to forestry, I wish to present some facts that show the magnitude of the interests which this subject involves and the conditions that they present for our action in the near future. In doing this I shall make no statements that are not supported by official statistics, nor shall I conceal any facts that might tend to modify the conclusions to which these facts directly lead.

TIMBER RESOURCES OF MAINE.

Maine is called the "Pine-Tree State." It bears the white-pine tree upon its seal, and the supplies of that timber were once believed to be inexhaustible. Upon the faith of these expectations, extensive ship-building interests sprung up along its coast, and large amounts of capital were invested in this industry, which in 1855 amounted to nearly 216,000 tons. These native supplies have been nearly exhausted within reach of these ship-yards, so that they have found it cheaper to bring materials from the southern coast and from Canada. In 1879 the tonnage built was less than 43,000 for the whole State, or only about one-fifth part as much as it was about a quarter of a century ago.

The principal part of the timber of that State is now floated down the rivers and cut up into lumber in mills near the coast. One of the principal of these rivers, the Penobscot, drains an immense area of the timber region of the interior, and we have in the records kept by the State inspector at Bangor a continuous statement of the kinds and qualities of timber that has been taken out from that region for fifty years.

The totals are before me in detail, and when summarized in periods of five years, ending in the middle and last of each decade, give feet, board measure, the following average annual results:

Annual average quantities of lumber inspected at Bangor, Maine, by periods since 1832, (*feet, board measure.*)

Period.	Green pine.	Dry pine.	Hemlock.	Spruce.	Total.
1832 to 1835					44, 926, 299
1836 to 1840					69, 664, 741
1841 to 1845					117, 298, 060
1846 to 1850					181, 689, 076
1851 to 1855	100, 017, 571	15, 371, 149	11, 447, 655	64, 283, 237	191, 119, 613
1856 to 1860	72, 976, 757	13, 180, 829	13, 997, 306	70, 331, 840	170, 486, 731
1861 to 1865	43, 716, 243	11, 614, 139	12, 212, 669	97, 675, 997	165, 219, 048
1866 to 1870	37, 266, 219	9, 954, 360	18, 273, 962	145, 961, 625	211, 456, 166
1871 to 1875	26, 859, 263	6, 667, 538	19, 148, 000	144, 244, 747	196, 919, 548
1876 to 1880	11, 328, 578	6, 046, 979	15, 361, 561	86, 481, 394	120, 228, 513

	Total feet.
Green pine, 1851 to 1880	1, 463, 323, 162
Dry pine, 1851 to 1880	314, 224, 971
Hemlock, 1851 to 1880	454, 705, 768
Spruce, 1851 to 1880	2, 953, 321, 038
Total, 1832 to 1880	7, 300, 153, 671

In nearest millions of feet, board measure, the quantity of green-pine timber inspected at Bangor in 1851–'55 averaged 100,000,000 a year. In periods of five years, the annual averages have since gone down to 73,000,000, 43,700,000, 37,200,000, 26,800,000, and 11,800,000. The dry pine has steadily declined during the same period from 15,400,000 to 6,000,000. The hemlock, on the contrary, went up for a time as it came to supply the place of pine; but this has again declined, the numbers by periods having been 11,400,000, 13,900,000, 12,200,000, 19,100,000, and 15,800,000.

The spruce, which, in 1851–'55, was about thirty-six millions below the pine, went up to a much greater figure and remained there for several years, but has within the last five years steadily and rapidly declined with every prospect of its continuing to descend as the supplies have become scarce. The quantities by millions of the spruce in these five-year periods were 64,300,000, 70,300,000, 97,600,000, 145,900,000, 144,200,000, and 86,400,000. Within the last four years immense quantities of spruce have died off, probably from the injuries of insects, upon the upper waters of the Saint John River, Maine, the loss being estimated at over a billion of feet, or more than $10,000,000 at the market prices of this lumber.

Yet with these facts before us, we will sometimes meet with gentlemen who, reasoning from what they may see upon their own horizon, tell us that timber grows as fast as it is cut; that there is as much now as ever there was, and that of the supply there will be no end.

We admit that there are now many old fields where the worn-out land has again become covered with a growth of trees that look in the distance like a forest, but when these thickets are entered we soon learn that the timber composing them is not fit for consumption. If let alone and suitably protected, they will in time become valuable forests, but it is very unsafe to depend upon these young growths in estimating the existing timber resources of the country.

CENSUS REPORTS OF 1880.

The Census Office has published in a series of circulars the returns obtained by the inquiries of 1880 so far as they relate to the standing timber and the lumber productions of the more important seats of this industry in the United States. These circulars are accompanied by colored maps purporting to represent the areas from which the timber has been principally cut away, and those that remain. The accuracy of these returns has been questioned in some quarters. Indeed there is nothing more difficult than to obtain accurate statistics of a forest that has not been carefully surveyed and explored by experts, and the best that could be expected would be the most careful estimates by disinterested and intelligent persons who were familiar with the business and who had no motives for concealment or overstatement of the result.

THE GREAT TIMBER REGION OF THE NORTHWEST.

Accepting, therefore, these statements as the best that could be obtained, and in the main as correct, let us see what they show of what has been for years called the "great timber region of the Northwest." This region includes the Upper and Lower Peninsulas of Michigan, the northern part of Wisconsin, and the eastern part of Minnesota. It occupies all of the upper waters of the Mississippi and its tributaries and the shores of the upper lakes, and the waters flowing into them, that furnish any timber for the market or that ever can, except as it may be supplied by future cultivation.

It comprises the region that has for many years supplied with building and fencing material the whole of the prairie region to the south and west of it; that has sent immense quantities of lumber and timber to the eastern markets and to foreign countries, and that is at the present time prosecuting these destructive industries with greater energy than ever before, new mills being erected by the dozen every year, and many of these with a capacity of cutting more logs into lumber every day than the old-time saw-mills could do in a year.

The total estimates for the whole of these three States give the following quantities still standing in the forests and the quantities cut the preceding year:

Timber supply of Michigan, Wisconsin, and Minnesota, as reported by the census of 1880.

States.	Quantity standing in the forests.	Remarks.
Michigan, Upper Peninsula:*		
White pine ....ft. b. m..	6, 000, 000, 000	328,438,000 feet cut in year previous, including 106,482,000 shingles and 34,266,000 laths.
Hard wood ....cords..	124, 500, 000	Cut, exclusive of fuel and ties, 1,145,100 feet in year previous.
Cedar ....cords..	62, 500, 000	
Lower Peninsula: †		
White pine, (ft. b. m.:)		4,068,773,000 feet cut, b. m., including 2,988,600,000 shingles and 428,445,000 laths cut, exclusive of 36,000,000 staves and 3,330,000 sets of headings.
Saginaw, &c	7, 000, 000, 000	
Lake Huron side	8, 000, 000, 000	
Lake Michigan side	14, 000, 000, 000	
Total Lower Peninsula....	29, 000, 000, 000	440,944,000 ft. cut year previous, besides 163,821,000 staves and 18,567,000 sets of headings.
Hard wood..............cords..	575, 500, 000	
Cedar ....cords..	5, 000, 000	
Hemlock...................feet..	7, 000, 000, 000	
Hemlock bark..........cords..	7, 000, 000	
Wisconsin: ‡		
White pine, (ft. b. m.:)		
Saint Croix River	2, 500, 000, 000	2,097,299,000 ft., b. m., cut the year before, including 1,007,039,000 shingles and 348,301,000 laths.
Chippewa River..............	15, 000, 000, 000	
Black River	900, 000, 000	
Wisconsin River..............	10, 000, 000, 000	
Wolf River...................	600, 000, 000	
Oconto River..................	500, 000, 000	
Peshtigo River	1, 500, 000, 000	
Menomonee River	6, 400, 000, 000	
Lake Superior shore..........	3, 600, 000, 000	
Total standing pine.........	41, 000, 000, 000	
Hard wood, &c., in four counties § ....cords..	12, 000, 000	Cut in year previous, 117,041,000 feet, exclusive of 86,545,000 staves and 7,498,000 sets of headings.

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* Supply will last 18 + years at rate of year previous.
† Supply will last 7 + years at rate of year previous.
‡ Supply will last 20 — years at rate of year previous.
§ In four counties; no estimates of hard woods from other counties; 62,800,000 posts, telegraph poles, and ties of cedar, besides tamrack and spruce.

Timber supply of Michigan, Wisconsin, and Minnesota—Continued.

States.	Quantity standing in the forests.	Remarks.
Minnesota: *		
Standing pine, (ft. b. m.:)		
Rainy Lake and Rainy River.	300, 000, 000	540,997,000 ft., b. m., including 187,836,000 shingles and 88,088,000 laths.
Shore of Lake Superior......	800, 000, 000	
Saint Louis River and tributaries.	1, 500, 000, 000	
Mississippi River and tributaries.	2, 900, 000, 000	
Red Lake River and other tributaries of the Red River.	600, 000, 000	
Total	6, 100, 000, 000	
In the belt of country south of the pine region:		
Hard wood.............cords..	57, 600, 000	36,884,000 ft. cut the year previous, besides 7,825,000 staves and [illegible]47,000 sets of headings.
Total number of feet of pine in the three States of Michigan, Minnesota, and Wisconsin. †	82, 100, 000, 000	7,035,507,000

* Supply will last 11 + years at rate of year previous.

† Supply will last 11½ years at rate of year previous.

We have here 6,000,000,000 feet of white pine in the Upper Peninsula of Michigan, and about a third of a billion used the preceding year. At this rate of usage the supply will last about eighteen years.

In the Lower Peninsula we have 29,000,000,000 in the supply, and 4,000,000,000 used, or enough at present rates for seven years.

In Wisconsin we have 41,000,000,000, and a consumption of over 2,000,000,000, or a supply for less than twenty years; and in Minnesota 6,100,000,000, and over half a million used, or enough for eleven years.

If we consolidate the whole we find an estimate of 82,100,000,000 feet of standing pine, board measure, and a production of 7,035,500,000 feet of lumber in the last year. The one quantity is contained in the other something less than twelve times.

This guarantee of immunity for a dozen years depends upon the assumption that the production shall continue at present rates and that no forest fires or other casualties shall intervene. Let us see what past experience in recent years will lead us to expect.

TIMBER ON THE UPPER WATERS OF THE MISSISSIPPI.

In Minnesota the whole State is credited with 6,100,000,000 feet of standing pine. The Upper Mississippi is reported as having 2,900,000,000 feet.

The business statements of the Mississippi and Rum River Boom Company for ten years show the following amount of logs, in board measure, as scaled by them:

Year.	Feet.	Increase on previous years.	Decrease from previous years.
1872	146, 572, 250		
1873	164, 743, 150	18, 170, 900	
1874	192, 482, 520	27, 739, 370	
1875	149, 350, 820		43, 131, 700
1876	178, 222, 990	28, 872, 170	
1877	120, 368, 260		57, 854, 730
1878	102, 479, 520		17, 888, 740
1879	161, 245, 510	58, 765, 990	
1880	207, 043, 320	45, 797, 810	
1881	215, 000, 000	7, 956, 680	
Total	1, 637, 508, 340		

The reporter remarks that in 1876 he ascertained that the logs averaged 218 feet. Two years after they averaged 161 feet, and in 1880, 187 feet, and adds, "One is struck by the large number of small logs in the booms, many of them being no thicker than a man's leg."

Stumpage had increased one-third in a year and a half. In the above table we have in six years a gain, and in three years a decrease from the preceding year. As we understand it, nearly the whole of the above quantities are pine. The other kinds must be relatively small and largely overbalanced by the pine production coming out by other means and used in local supply.

Now, if the census and these trade statistics are both correct, the yield of 1881 was nearly a thirteenth part of the amount standing the year before. The year is spoken of as one of "wonderful prosperity," and at the present time the pineries are dotted all through with lumber camps, and new mills are going up at various points to anticipate the "success" which increased production and advancing prices appear to promise.

The following is a comparative statement of the entire cut of lumber upon the Upper Mississippi during the past ten years:

Year.	Feet.	Year.	Feet.
1872	179, 722, 250	1878	149, 759, 500
1873	197, 743, 150	1879	201, 778, 725
1874	217, 466, 520	1880	270, 377, 230
1875	172, 775, 000	1881	334, 932, 503
1876	216, 910, 900		
1877	150, 330, 460	Total	2, 091, 796, 238

As to the accuracy of the data from which these statements are made—those of production of lumber are made up from reports and inquiries among the lumbermen at the end of each year, and published as information for their own benefit in the journals devoted to their interest. There is no reason to suppose that in any instance they overrun the truth, but there are many ways in which they may fall short. There are local mills that make no reports, and local demands of which no account is taken. We make no charges against the census with regard to its accuracy, but seriously hope that it may be found in error with regard to the supply. But even allowing these estimates to be too small by half, we would gain but a brief respite under the increasing rates of consumption from the calamity that is approaching.

THE LUMBER MARKET OF CHICAGO.

We know that Chicago is the greatest lumber market of the world; that it distributes the forest products coming to it by lake and railroad all over the prairie country to the south and southwest of it and along the lines of railway to great distances in the interior. The details of these receipts might readily be given, but without occupying time in reading them I may say that they amounted in 1881 to over two thousand millions of feet of pine, and that the total product of the Northwestern States, as reported in the trade, was fully up to the estimates of the census as already given. The single item of sawed lumber received at Chicago in 1881 would lay an inch flooring about fourteen feet wide around the earth at the equator; and the amount manufactured in the three States of Michigan, Wisconsin, and Minnesota during the last year would lay such a floor of more than fifty feet in width.

These are no ideal fancies; they are stubborn facts. They are made up from returns of business collected by those engaged in the lumber trade, and give the results of operations so far as they could be gathered, and if they are imperfect the error is in their falling short of the true amount.

PINE TIMBER OF THE SOUTHERN STATES.

The Census has published circulars and maps giving estimates of standing pine in 1880 and of the production of the year previous for the States of Alabama, Florida, Mississippi, and Texas, which show the following results:

States.	Feet (board measure) of merchantable standing pine, May 31, 1880.	Feet of lumber cut the year previous.	Years that the standing pine would last at rates of use the year previous.
Alabama	18, 885, 000, 000	245, 396, 000	77 —
Florida	6, 615, 000, 000	208, 054, 000	32 —
Mississippi	23, 975, 000, 000	115, 775, 000	207 +
Texas	67, 508, 500, 000	274, 440, 000	24 +
Total	116, 983, 590, 000	843, 665, 000	130 +

These quantities appear large, and the day distant when they will be used up. But we must remember that the lumber business is still in its infancy, and that in many points but a recent beginning has been made in it in this region.

The exportation of hewn timber from Mobile to foreign countries in 1880 was much greater than in any previous year, and 114 per cent. above the quantity in 1879. The sawed timber was an increase of 240 per cent. upon the preceding year.

At the rates of present consumption in the Northwest the whole of the supply above reported would last less than seventeen years; and the years now estimated in hundreds would soon diminish to those expressed by unit figures, under the demand that would be thrown upon these resources for domestic wants and the foreign trade.

THE INFLUENCE OF RAILROADS UPON THE TIMBER SUPPLY.

The vast and rapidly increasing extent of our railroad system, which at the present moment can scarcely be less than one hundred thousand miles, has a most important bearing upon the question of our forest supplies. This effect is not limited to the vast consumption that they occasion in supplying ties and other timber materials for the new constructions and renewals that are constantly going on. These roads are everywhere penetrating the timber regions of the country, many of them being built for the express purpose of getting out the timber that was before inaccessible by the old methods of floating upon rivers or hauling in winter by teams. It is but a comparatively recent period since this feature in lumbering was introduced, and its direct and speedy effect is to hasten the exhaustion of these supplies that were going off too fast for the needs of the present and of the future. The obvious effect of this will be to keep up the supply at the mills so long as there are forests from whence it can be obtained. They will distribute the manufactured lumber over a wider area and to greater distances to meet the wants of regions that have already used up their own forest resources, and they will doubtless extend for a little while the time of apparent "abundance" and of "inexhaustible supply."

But while they are doing this, they will be every day equalizing the ruin that must inevitably follow this vast and rapidly increasing destruction, that will happen to the country in the near future, unless seasonable and adequate measures are taken to meet these future wants by extensive and judicious planting and by effectual measures for economizing our remaining supplies. We shall be soon enough admonished of this necessity by the rapidly gaining prices of our timber; but it is not wise to wait for this extremity until it is directly upon us; we should anticipate these wants, for it takes many years for a seedling sprout to become a tree fit for timber and boards.

The duty before us is a most important one, and it presents two principal points for consideration, namely: first, as to how far and in what manner the General Government can withdraw its remaining timber lands from entry under existing laws and place them under regulations calculated to secure the greatest benefit to the present in the use of timber that is now fully mature, and that shall at the same time have due regard to the requirements of the future; secondly, as to how we may most thoroughly impress upon the owners of land the importance of planting, and as to how far and in what manner it is the duty of Congress to encourage this object.

The first of these is a complex question, and one that must be carefully considered in all its bearings before we can adopt a definite policy concerning it. Upon inquiry of the author of this report, I learn that he has given the subject much attention, and that suggestions are made as to the measures that may be adopted. Until the report is before us no opinion can be expressed as to the feasibility of these plans, and they may require a further study before action can be had upon the subject. There can be no doubt but that property of this kind under the care of persons who have an interest in its protection, and the law for their support, would be better cared for than if exposed, as it now is, to the plunder of everybody.

The second point is of greater importance, because it affects the whole country and applies everywhere alike to the owners of the land.

We find in our country conditions of ownership that are in general very different from those that prevail in Europe. We have no lands belonging to the Government that are scattered here and there all over the country, to be reserved for timber growth, and cared for by skilled foresters. Our towns, cities, and villages own no lands for common usage; our public institutions have no landed estates that need the special care of Government; we have no great hereditary domains belonging to titled owners, and we have no privileged classes. Almost the whole of our lands, excepting what remain under the care of the General Land Office, belong to farmers in actual possession, under absolute titles that assure perpetual ownership. We cannot require them to plant trees nor prevent them from cutting off their woodlands—at least not under the present state of public opinion; and nothing but sad necessity alone could ever hereafter so change this opinion as to justify and support restrictive legislation upon this subject. We cannot dictate in this matter. We certainly can never plant woodlands upon private property at the public expense, unless in the exceptional and local instances where this becomes a public necessity for the protection of some other interest.

It has been shown by long experience in Europe that timber can be grown with profit upon lands suitable for no other kind of use, and that by careful and intelligent management a permanent supply may be maintained.

It has long since been found that nothing will so effectually restore fertility to worn-out lands as a crop of trees, with the accumulation of organic materials that is constantly forming under them from the air and the soil. It is also proved by the experience of every careful observer that groves of woodland afford protection to the surrounding fields in the cooling and equalizing influence in mitigating the extremes of heat and cold, and by a perceptible and often decided effect in preventing injuries from drought. They afford resting places for insectivorous birds, and thus promote the destruction of insects to the profit of our grains and fruits. They screen us against the hot and dry winds of summer and the sweeping and piercing storms of winter, that are sometimes so severely felt, especially in the prairie regions of the West.

There can be no doubt but that timber can be grown within the United States sufficient for all the wants of its own inhabitants, but we must learn to regulate these wants and to guard against waste. We must diligently study the methods of cultivation that lead to most profitable results, and the kinds of trees that produce the most thrifty growth and the most valuable products.

In short, our first and greatest duty is to impress upon the owners of the land that it is in their interest to devote a portion of their land to the planting of groves of trees. We should establish experiment stations for the careful study of the requirements and capabilities of soils and of different kinds of trees, and we should publish the results of these observations in a form particularly calculated to impress the importance of these measures and to teach the plainest and simplest rules for securing their success.

If we rightly read the signs of the times public attention is already awakening upon this subject, and we should lead this question, and not wait to be driven by it, in whatever measures may appear necessary for the promotion of this object.

In recent journals we see accounts of gigantic monopolies springing up for "cornering" the great supplies of timber still in the hands of Government on the Pacific coast. Should we not "corner" these monopolies in the interest of the Government before we get "cornered" by them?

It would be a difficult matter to adopt any of the systems of forest management found in Europe, because our conditions are very different, and the persons skilled in this business cannot be had; but we might, without these, adopt systems of protection and regulation in the sale of products, to the great benefit of the public Treasury, and we might adopt, upon a limited scale, a system of conservation and cultivation, as they are doing in the English colonies of

Australia, that should every year expand in magnitude, as the means of the service allowed, and as the results of the experience might lead.

In this connection we may further remark that success in timber culture depends upon a combination of favorable conditions in soil, climate, and the choice of kinds best adapted to them. In common agriculture if we make a mistake in one year we can correct it in the next, and in a few years of experience can generally ascertain what particular crops and what plan of cultivation are best calculated to secure uniform success.

But in forestry we may lose half a life-time before we learn that some particular kinds of timber would have yielded twice the profit of those that have been growing with indifferent success during this period, and that finally ends in failure. We cannot afford to make mistakes in this matter, and therefore need all the more as thorough a knowledge of the capacity of soils, the effect of climates, and the adaptation of trees to these conditions as science can teach us.

Our first needs are the fruits of experience in foreign countries and in our own, and a widespread and realizing appreciation of the importance of this subject that shall induce the owners of land to adopt effectual measures for economizing the existing timber resources of the country, and to invest for an ample future profit by liberal and judicious planting. We should look upon this great question in the light of political economy, and consider it as we judge of common business transactions when we would desire to learn whether they tend to profit or ruin. The growth of the woodland may be compared to the interest upon invested capital, and where in any country the rate of use is not greater than that of supply such a country may be compared to an individual who has his money safely invested, and is living upon his income. When he spends beyond his receipts his principal is wasted, and if the rate of expenditure is increased his ruin is hastened.

Now, this is exactly the condition of this country upon the timber question: we are using up the capital which nature had for centuries been providing for us in the growth of forests, and we are doing nothing to restore them. Under skillful management the supply might be so arranged that in twenty-five or thirty years for some kinds, and in fifty or sixty years for others, a new crop would be furnished by growth, and if only a twenty-fifth or thirtieth part of the former or fiftieth or sixtieth part of the latter were taken yearly the supply would be perpetual.

But instead of this we are taking a tenth or a twentieth part every year while the growth, under our neglect, is not a fourth part of what it should be where any growth is allowed, and this is exceptional rather than common, for generally the lands cleared are brought under cultivation.

We shall only too soon be reminded of the consequences of this improvidence in the growing prices of lumber, which in some kinds have already doubled within a very few years and which are advancing every day.

These advances may by some be ascribed to speculation, and doubtless to some extent they are, for the speculator never loses a chance to turn a penny in his own favor, it matters not who suffers; but when this advance is steadily going on from month to month and from year to year, at an accelerating rate, it means that the intrinsic value of the commodity that they represent is becoming greater under the combined effects of diminishing supply and increasing demand. It will inevitably lead to the realizing conviction that there is profit in growing timber, and the sooner this is understood and acted upon the better will it be for the country and for the future.

In order that this may be done to the best advantage we want all the light that can be thrown upon it from the experience of other countries, and from researches and experiments in our own, and it is for this very object that these inquiries in forestry are intended.

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